

WARRENTON BIOMASS FACILITY

Warrenton is a town of 8,500 people situated 50 miles west of Washington D.C. It is the seat of Fauquier County, a county of 60,000 people. It is a semi-rural county with more than 50,000 acres of farmland and 100,000 acres of public and private woods. Reflecting the state average, half the farmland is no longer being used and therefore is available for new energy crops.

Mayor George Fitch has launched a Green Initiative to reduce the carbon footprint in the area or as he likes to say, “to put Warrenton on a low carbon diet.” The Initiative includes a green building code, improving the energy efficiency of government buildings, establishing a carbon footprint baseline through energy audits and powering a new indoor recreation center of 25,000 square feet with solar panels and methane gas captured at the nearby sewer treatment plant.

The centerpiece of the Green Initiative is a biomass plant at the landfill just outside the town limits. The plant would use suitable wastes and residues within an economic radius, i.e. 25 to 50 miles, to produce both electricity and ethanol. The goal is to make Warrenton energy independent where its electricity and fuel come exclusively from renewable resources.

The prefeasibility study has shown that there is enough feedstock for a minimum 250 ton per day operation that, based on certain technology, should provide at least 5 MW of electricity – surplus to the needs of the plant – and 10 million gallons of ethanol. The 5MW of electricity is enough to supply all the households in Warrenton. The 10 million gallons of ethanol would be made available at two local service stations, and perhaps Wal-Mart and any surplus would be easily sold into the 160 million gallon a year mandate market in Virginia.

Most of the feedstock is already available at the landfill. There are 65,000 tons of MSW delivered every year and 60,000 tons of C&D (construction and demolition). About 80% of the MSW and 45% of the C&D is suitable for the plant. A lower tipping fee would attract more MSW. Estimates of other feedstock such as animal manures, poultry litter and sewer sludge are being developed.

A major source of feedstock are agriculture and forest residues. There is a daily supply potential of 2,000 tons of agriculture residues (corn stover and soybean stubble) within a 50 mile radius and 550 tons within a 25 mile radius. Realistically, 5% to 15% of this potential could become available. There is also a daily supply potential of 1,100 tons of mill residues, 1,000 tons of forest residues and 1,200 tons of thinnings.

For the long term, energy crops like switchgrass or miscanthus can be planted on idle farmland, including CRP land. The potential has been estimated at 375 tons per day.

In addition to these feedstocks which are available locally, there are other biomass materials which could be captured. These include used tires, auto shredded material, tree clippings from utility contractors and state highway contractors.

Several conversion technologies claim to be able to process a wide variety of biomass and produce both power and liquid fuel. Some use a biochemical process while others a thermochemical, gasification process. None has been proven on a commercial scale. The US Department of Energy recently awarded grants to demonstrate these different technologies on a commercial scale. However, none of these projects involve using so many different types of feedstocks to co-produce electricity and ethanol.

The technology to be used by a small scale integrated biorefinery has developed to the point where it is ready to be demonstrated. Warrenton will be the demonstration project. The particular technology for the Warrenton project will be determined with the help of Pacific National Laboratories which is being engaged to assist with the feasibility study.

The economic feasibility depends to a large extent on the efficiency and cost effectiveness of the technology. The tax credits and production incentives for biomass ethanol and electricity greatly enhance the economic feasibility. A financial analysis is being prepared for a 250 ton per day, scaled up to 600 ton per day, integrated biorefinery with an initial capital cost of \$30 million.

The feasibility study should be completed in June. If it confirms the prefeasibility study, then we will proceed to the next stage which will be the design and engineering of a scaled up plant as well more conclusive discussions with strategic partners in the fields of energy, transportation fuels, agribusiness and technology.

It is our hope to obtain a loan guarantee from USDA or DOE for the estimated \$30 million capital cost. These agencies are expected to have between \$2 billion and \$5 billion in loan guarantees for biomass energy plants. At least \$200 million is expected to be earmarked for small scale operations in rural communities.

The Warrenton biomass facility can serve as a model for other communities. The business model is easily transferable to other communities in the United States (and in other countries). Small scale biorefineries at landfills producing at least 10 million gallons of ethanol will contribute greatly to the goal of 35 billion gallons of ethanol by 2020.